Safety Engineering

UDC:338.48:004.4
DOI:10.7562/SE2022.12.01.05
Research paper
www.safety.ni.ac.rs

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ENVIRONMENTAL MONITORING AND CONTEMPORARY ORGANIZATION

Abstract: *There is a continual need to monitor all activities carried out within the environmental management framework. However, to monitor any activity, constant data collection, i.e. monitoring, is required. Responsible environmental management means adequate monitoring, which implies the process of collecting data not only on the state of the environment but also on the ecological efficiency of a contemporary organization, law enforcement, and implementation of strategies, programs and plans. In addition to the operationalization of basic research terms, the paper also considers the importance of the application of environmental monitoring instruments by a contemporary organization.*

Key words: environmental management, modern organization, environmental monitoring

INTRODUCTION

The literature review shows that the most common risk in the workplace and the natural environment that can affect the safety of both is industrial pollution as a consequence of non-compliance with safety standards in industrial production, high-risk industrial processes and handling of toxic and radioactive materials, all of which can cause accidents, breakdowns and large-scale pollution on the affected territory and beyond [1]. For adequate environmental management, it is necessary to conduct proper environmental monitoring activities and apply appropriate legal instruments. Monitoring is carried out by systematic observation of indicator values, that is, by observing negative effects on the environment, the state of the environment, measures and activities undertaken with the aim of reducing negative impacts and increasing the level of environmental quality. Environmental management at the level of modern organizations which can be major or minor polluters depending on the activities they are dealing with is an integral part of the environmental management system. Organizations should mobilize all employees and adapt their systems, strategies, resources and structure to all environmental management system-related requirements. In the context of this work, systematic and comprehensive monitoring of the environment is a prerequisite for reliable determination of the status of various environmental media, but also the environmental performance of modern organizational processes, as a basis for planning the use of environmental resources and effective integrated management of the environment. The responsibility for the establishment and execution of this type of monitoring usually rests with an organization that has an established environmental management system, through the adoption of an annual monitoring program and the provision of conditions for its implementation.

CONCEPTUAL AND THEORETICAL APPROACH

Environmental management

Regarding the conceptual definition of environmental management, the terms "ecological management" or "eco-management" are also used today, although the term "environmental management" is used more frequently in foreign literature.

In our country, both terms have a similar meaning and refer to several management activities related to ecology, and therefore to the environment. If we look at the differences between these two concepts, we can see that the term "environmental management" is related to management when solving problems that are directly related to the environment, specifically to water, air, waste, etc. (waste management, water resources management, etc.). On the other hand, the term "ecological management" is used in the management of individual economic entities to achieve compliance with all requirements related to the state and conditions of the environment through economic activities [2].

There is no generally accepted and universal definition of environmental management due to the breadth and variety of topics. However, ecological management is determined by characteristic goals, so it could be said that it represents an environmental protection management system, which aims to establish a systematized and unified approach in industry and other branches and which ensures that environmental reasons become an integral part of business strategy and practice. If management is taken to refer to the process by which economic or other activity is planned, organized, coordinated, and controlled, then ecological management refers to the process by which economic or other activity in the field of ecology is planned, organized, coordinated, and controlled in an ecological

way, or by which goals in the domain of ecology are achieved [3].

Environmental management in the broadest sense can be defined as a discipline focusing on the relationship between humans and the environment [4]. Management represents the aspiration to eliminate negative tendencies and influences in relation to the environment and human health. Managing the environment means carrying out basic strategic activities that determine the means and define the protection criteria as well as the directions of environmental development [5]. Environmental management is a technique used to manage environmental processes. It defines what is environmentally friendly as well as what is an environmental, economic, social, and technological barrier to improving the protection process [6].

Contemporary organization

The very notion of an organization is derived from the Greek word *organon*, which literally means a tool, a device. An organization is a group of two or more people working in a structured way to achieve one or more goals. The following elements that characterize each organization are listed in the literature: organizations are social entities (consisting of two or more persons); they are carefully structured to get the job done efficiently; they are goal-oriented and have the resources that members of the organization will use; organizations have management that directs all other elements (people, resources) towards achieving goals. The concept of organization is not static but changes over time in each environment [7].

The growing complexity of business, the emphasized interdependence of phenomena, and the exponential growth of knowledge create the conditions for the development of the modern theory of organization. With the development of computer systems and quantitative methods, as well as system theory, there is a modern theory of organization, where the organization and its parts are observed according to the principles of the systems approach. The systemic approach views the organization as an open system, made up of subsystems, parts, and processes that achieve balance through regulation. Modern organizations, whether economic or non-economic, require constant management actions to operate and develop in the complex and dynamic environment [7]. Larger organizations are complex to manage, as they need to invest more energy to coordinate their departments, require enormous resources, and are slow to respond to changes in the environment.

All successful economies today generally have large private sectors that adapt to changes in the environment. Internal coordination in companies is more efficient and that is why they are growing, unlike small interdependent companies. An efficient bureaucracy with the superior skills of its employees is a new intellectual tool.

The emergence of information technologies was necessary for the development of modern organizational schemes. The pattern of creating modern organizations is based on an explicit analysis of the problem. Raising "the model from the level of the subconscious, they made it available for verification and improvement" [8]. This is the very foundation of modern organizations. Every contemporary organization is affected by the environment in which it operates. One of the definitions of the environment is "the system of forces that surround the organization and affect the way it functions as well as the access to its resources" [9]. The organizational environment is usually divided into internal (the totality of connections and relations between and within the company's resources) and external (individuals or groups of organizations that are outside the organization but are also in direct interaction with it) [10]. Organization as a structure is a feature of all social systems that differ from natural systems in their characteristics. Natural and social systems represent a dynamic system whose parts are in a variable relationship based on the principle of feedback [11]. Whether they are small organizations or companies with their autonomous units (departments), all activities and processes that take place within them, as well as products, have a certain impact on the environment in one of the phases of the life cycle.

CONTEMPORARY ORGANIZATION AND THE ENVIRONMENTAL ASPECTS

When introducing the ISO 14000 standard, it is important to consider the relationship between environmental aspects, environmental impact, and its control systems. Elements of activities, products, and services of a contemporary organization that interacts with the environment are called environmental aspects [12]. The term "environmental aspect" itself should be understood as an aspect through which an organization affects or may affect the environment (for example, the environmental aspect "wastewater discharge" implies that an organization may have an impact on the environment, i.e. pollute watercourses, land, etc.). Environmental impact is defined as any environmental change, improvement, or deterioration, that is entirely or partially a consequence of the activities of the organization, its products, or its services [13]. A modern organization needs to identify the environmental aspects that it can manage and those that it impacts. Aspects of the environment that are harmonized with national normative acts in the field of environmental protection and that are included in the management procedure in environmental protection are the following [12]: waste generation; wastewater discharge; rainwater discharge; air emission sources; exhaust emissions from cars; chemical operations; water use operations; energy operations; use of natural resources; cessation of product production; and waste disposal.

Table 1. *Examples of connections between activities, aspects, and environmental impact* [4,13]

Activity, product, or service	Aspect	Consequences of environmental impact
Product: Paper printing	Emission of organic solvents into the atmosphere	Air pollution by organic solvents
Activity: Transport of dangerous substances	Potential spill of dangerous substances in case of an accident	Pollution of land/water, endangered biodiversity
Service: Supply of settlements with hot water (district heating)	Combustion of fossil fuels	Emission of harmful gases

Activities related to the products and services of an organization produce environmental impacts (positive or negative). All these environmental impacts, as well as any changes in them, are defined by the standard. The elements of the control system are designed and applied according to the aspects of the organization's environment and environmental impact [8].

At some stage in their life cycle, almost all products, services, and activities have a certain impact on the environment (local, regional, or global). To determine the interaction of products and processes of the organization with the environment, it is necessary to [12]:

- select the categories of products and services of the organization;
- identify environmental aspects for each product category;
- assess the significance of the environmental impact for each identified aspect;
- define measures to eliminate, reduce, and/or manage risks.

ENVIRONMENTAL MONITORING INSTRUMENTS

The primary objectives of environmental monitoring are warning of danger and prevention of unwanted consequences for the environment and monitoring of already occurring changes to prevent further negative impact on the environment. Monitoring can refer to environmental components (air, water, soil, biodiversity) or to economic activities that affect the environment (industry, energy, agriculture, transport, and tourism). Specific research institutions at the national and local level, in accordance with their legally established competences, perform this type of monitoring. All industrial plants that represent a source of environmental pollution have the obligation to monitor the impact of their activities on the environment. They also monitor the effectiveness of the applied measures to prevent, create, or minimize the level of pollution. They are also obliged to prepare a monitoring plan, keep regular records, and submit reports to the competent institution in charge of managing the national environmental information system. From all national environmental information systems, data and information are consolidated and integrated into international systems. To include individual national reports on the state of the environment in a single report on the state of the environment in Europe, it is very important to establish a unique methodology for monitoring the state of the environment based on indicators as indicators of the state of a phenomenon [4].

According to the methodology of the European Environment Agency, the determination of environmental quality indicators is based on the relationship between the environment and human activity. These relationships are represented by indicators that "depict cause-and-effect relationships and represent the basis of the DPSIR methodology" (Ibid., p. 81).

The DPSIR methodology follows selected indicators based on which it gives an assessment of the state of the environment, as well as a definition of goals and a proposal for further measures to improve the current state. The methodology considers five groups of indicators [14]:

- indicators of driving factors (D);
- indicators of pressures on the environment (P);
- the state of environmental condition (S);
- impact indicators (I);
- indicators of reactions to the existing state of the environment (R).

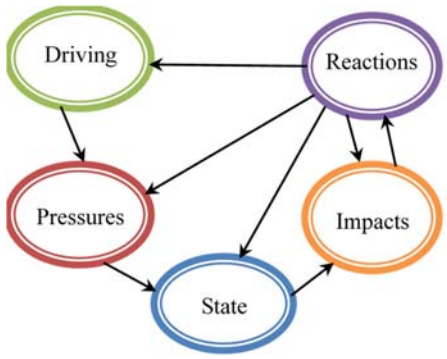

Figure 1. *DPSIR framework [14]*

According to the DPSIR framework, there is a chain of causal links starting with driving forces (economic

sectors, human activities, social and demographic conditions), through pressures caused by human activities (emissions, waste, resource use), to the state (physical, chemical, and biological phenomena in certain areas) and impacts as a cause-and-effect relationship (systems, human health, and functions). Ultimately, they lead to reactions (setting priorities, setting goals, indicators). Describing the causal chain from driving forces to impacts and reactions is a complex task and tends to be divided into subtasks (for example considering pressure-state relationships) [14].

On the other hand, the approach of a contemporary organization to environmental monitoring does not have to be based only on the DPSIR framework, but also on some others, of which PSR and DSR stand out. The PSR model was developed in the seventies of the 20th century, for the purposes of data organization in the field of the Canadian environment, and over time it began to be used in OECD (*Organization for Economic Cooperation and Development*) practice, namely in the working group for environmental conditions [15]. The PSR model represents a concept according to which anthropogenic activities generate pressures on the environment that result in changes in the state of the quality of environmental elements. Society reacts to observed changes in the state of the quality of environmental elements in different ways, starting from the change in the nature and intensity of the pressures it generates to the implementation of various plans for the protection and improvement of the quality of the environment. The usefulness of the PSR model is recognized at the global level, and the model can be applied at the supranational, national, regional or local level [16].

The DSR model was developed by the United Nations Commission on Sustainable Development (UNCSD) as part of a wider program related to the development and structuring of 134 indicators of sustainable development into a coherent system with units related to driving forces, states and reactions of society [17]. With this model, the category of pressures is contained within the framework of driving factors, and in this way it gives enough importance to economic, social and institutional indicators. The DSR model can be understood as a matrix in which the indicators are grouped horizontally into three basic units, while the vertical axis contains the basic components of sustainable development - social, ecological and environmental development [18].

No less important is the fact that, in addition to complementary methodological frameworks, the modern organization needs to harmonize the environmental monitoring system with the overall safety system of the given organization, with an emphasis on both safety and business continuity [19].

CONCLUSION

It is an inevitable fact that there is a close cause-and-effect relationship between a contemporary organization and the environment. All contemporary organizations considered a source of environmental pollution are responsible for monitoring, regular observation, measurement and evaluation of environmental parameters, changes in the quality and quantity of the environment, the emission of pollutants and the use of natural resources. They also monitor the effectiveness of applied measures for the prevention, occurrence or minimization of the pollution level. Their responsibility is as well the preparation of the monitoring plan, keeping regular records and submission of reports to the reference bodies responsible for the management of the national environmental information system.

It is clear that today's organizations operate in a turbulent market environment with pronounced dynamic competition. In such economic conditions, the choice and implementation of an adequate competitive strategy is a guiding star of a modern organization to run a successful business. In addition to environmental trends and strong global competition that exert excessive pressure on managers to channel their organizational activities towards the continuous development of key competencies in order to strengthen their market positions, it is necessary to direct organizational activities towards harmonizing their development with the ecological order in nature.

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Mirjana Galjak, Ph.D. works as a professor of vocational studies at the Kosovo and Metohija Academy of Applied Studies in Leposavić, Republic of Serbia. She is the author or co-author of a monograph, several textbooks and over 40 scientific papers published in scientific journals and proceedings of scientific conferences. She peer-reviewed a number of scientific and professional papers published in the proceedings of national and international conferences. She also took part in research projects. She is a member of the program board of the international scientific conference. Her research interests include: environmental management, sustainable development, occupational safety, emergency management and natural disasters.

MONITORING ŽIVOTNE SREDINE I SAVREMENA ORGANIZACIJA

Mirjana Galjak

Rezime: *Sve aktivnosti koje se sprovode u okviru upravljanja životnom sredinom potrebno je da se kontinuirano i adekvatno prate. Da bi se pratila bilo koja aktivnost neophodno je konstantno prikupljanje podataka odnosno monitoring. Odgovorno upravljanje životnom sredinom podrazumeva adekvatan monitoring koji predstavlja ne samo proces prikupljanja podataka o stanju životne sredine, već i podatke o ekološkoj efikasnosti savremene organizacije, sprovođenje zakona, implementaciju strategija, programa i planova. U radu se, pored operacionalizacije osnovnih istraživačkih pojmova, razmatra i značaj primene instrumenata za monitoring životne sredine u savremenim organizacijama..*

Ključne reči: upravljanje, životna sredina, savremena organizacija, monitoring